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On a Theorem of Sárközy and Furstenberg

A theorem of Sárközy and Furstenberg states that if $A \subseteq \mathbb{Z}$ with positive upper Banach density, then the set of quadratic return times $\{d \mid A \cap (A + d^2) \neq \emptyset\}$ is non-empty. Using Fourier analysis we give a new proof of the fact that the set of all quadratic return times is syndetic and obtain uniform lower bounds for the density of these return times.

This is joint work with Ákos Magyar.